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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/763,647	01/23/2004	Bill L.Looper	38190/270316	9390

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EXAMINER

BAREFORD, KATHERINE A

ART UNIT	PAPER NUMBER
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1762

DATE MAILED: 04/05/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/763,647

Applicant(s)

LOOPER ET AL.

Examiner

Katherine A. Bareford

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 20 February 2006.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-25 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-16 and 18-25 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Claim 17 is canceled

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

The amendment of Feb. 20, 2006, has been received and entered. As a result of the amendment, claim 17 has been canceled, and claims 1-16 and 18-25 are pending for examination.

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

3. Claims 1-16 and 18-25 are rejected under 35 U.S.C. 103(a) as being unpatentable over the admitted state of the prior art in view of Johnson (US 5893683), David et al (US 2002/0168241) and Kottilingam et al (US 2005/0015980).

The admitted state of the prior art teaches, at page 1 of the specification, that it is common to repair surface defects in a variety of workpieces, such as the skin of an aircraft. To repair the defect in an aircraft skin, for example, the area of the defect can be routed out, then the routed out area is grit blasted, then the area is filled using flame sprayed aluminum. Then, the coated area is sanded, and polished, to achieve the desired final surface finish.

Claims 8, 21: the workpiece can be an aircraft skin with a defect. Page 1.

Claims 9, 22: the portion of the workpiece that has been routed can be grit blasted prior to flame spraying, which would remove foreign particles. Page 1.

Claims 10, 11, 23, 24 : the workpiece that has been flame sprayed can be sanded and then polished. Page 1.

The admitted state of the prior art teaches all the features of these claims except the routing method and apparatus, and resulting routed surface appearance.

Johnson teaches a router device that can be used to rout aircraft components. Column 1, lines 1-10. The router is provided with a cutter head 14, with, at the free end, a rounded corner and an axial depression in the form of a truncated cone. Column 2, lines 40-55 and figure 1. The router has a bit area with two cutting surfaces. Column 2, lines 45-55 and figure 2. To treat the substrate, the router can be plunged into the

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portion of the workpiece to be routed in a direction generally orthogonal to the workpiece to remove a portion of the workpiece as desired. Column 4, lines 20-35 and figure 5. The routed portion is defined by a sidewall extending generally orthogonal to the workpiece and a bottom surface. Column 4, lines 20-35 and figure 5. The cutting edges have a relief angle. Figures 2-3 and column 2, lines 45-55.

David teaches a router apparatus system for removing damaged portions of aircraft skin. Abstract and paragraph [0004]. David teaches to provide for control of router based on the drilling/milling tool used, the material to be cut and its thickness, and the speed of movement of the router. Paragraph [0020]. The system can be controlled to provide precise depth of cuts into the skin. Paragraph [0021]. The depth of cut can be controlled to provide for vertical adjustments of micron sizing (0.001 inches) or finer to prevent damage. Paragraph [0030].

Kottlingham teaches a method of repairing a workpiece. Figures 1-3 and paragraph [0002]. The workpiece has a defect, such as a crack, and an area proximate the defect. Paragraph [0008]. A groove is formed on a portion of the workpiece including the defect such that the forming of the groove removes at least a portion of the workpiece proximate to the defect. Figures 1-2 and paragraphs [0020]-[0021]. The groove can be formed by any suitable method, including hand grinding and conventional machining. Paragraph [0020]. Depending on the defect, a countersink or counterboring tool can also be used to form the "groove". Paragraph [0032]. It is desirable to provide that the vertical depth of the groove is conical shaped to promote

better fusion, although other geometries can also be used. Paragraph [0021]. The groove is formed with dimensions selected to assist the repair process based on the size of the defect. Paragraph [0021]. After the groove is formed, the groove is filled with filler material by a thermal spray process such as micro plasma deposition. Paragraphs [0024] – [0027].

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the admitted state of the prior art to use the routing method of Johnson with the expectation of providing a desirably routed surface, because the admitted state the prior art teaches that it is well known to rout aircraft skin components in a defect area to allow for corrective application of a new flame sprayed coating, and Johnson teaches a desirable method for routing aircraft components using a router with two cutting surfaces and where the router plunges into the substrate. As to the angle of the cutting edges, Johnson provides that the cutting surfaces have relief angles, and one of ordinary skill in the art would perform routine experimentation to optimize the angle for the specific substrate and cutting to be performed. It would further have been obvious to modify the admitted state of the prior art in view of Johnson to using a precisely controlled microstop router system to perform the damage area removal and to provide a conical bottom surface when routing as suggested by David and Kottilingam, in order to provide an optimally repaired article, because the admitted state of the prior art in view of Johnson teaches to use a router system to remove damaged aircraft skin for repair, and Kottilingam teaches to remove damaged

area based on the specific size of the defect to be removed and that a conical depth (or bottom) of the groove formed is desirable for better fusion of the replacement material, and David teaches a router system for aircraft skin that can be controlled to remove precise areas desired. As to the use of countersink with the router, it is the Examiner's position that countersink is conventionally used with routers and David teaches to use various commercially available routers (see paragraph [0030]), thus indicating that desirable results would be expected when using such a router, and as well, Kottilingam notes that a countersink tool can be used for the damaged area removal. As to controlling the depth in predefined increments, this would be suggested when using the combination of references, because Johnson teaches to plunge in incrementally, and David teaches that depth can be controlled in 0.001 inch ranges, and the references suggest removing precisely controlled amounts. As to the diameter of the router bit and the depth of the routing, it would have been obvious to one of ordinary skill to optimize these features, based on the specific router used, the material to be cut and its thickness, as the combination of prior art teaches to control the material removed based on the specific amount of damage present in the area to be repaired and to also base the operating conditions of the router on the specific router used, the material to be cut and its thickness.

4. The rejection of claims 1-16 and 18-25 under 35 U.S.C. 103(a) as being unpatentable over the admitted state of the prior art in view of Johnson (US 5893683),

David et al (US 2002/0168241) and Japan 01-188657 (hereinafter '657) is withdrawn due to applicant's amendments and arguments of Feb. 20, 2006.

Response to Arguments

5. Applicant's arguments filed Feb. 20, 2006 have been fully considered but they are not persuasive.

As to the rejection of claims 1-16 and 18-25 using the admitted state of the prior art in view of Johnson, David and Kottilingam, applicant argues (1) that Kottilingham teaches away from a combination with the other references, because claims 1 and 13 now require that the routing removes the defect and a portion of the workpiece proximate to the defect, and Kottilingham specifically teaches away from removing the defect. (2) Applicant further argues that none of the cited references disclose routing such that the routed portion includes a sidewall and a conical bottom surface as claimed. According to applicant, Johnson shows a vertical sidewall and horizontal bottom surface joined by a rounded edge within the workpiece, and does not show the sharp edges that can be formed in the present application. Even if Johnson's disclosure that the corners may be left square corresponds to a disclosure of an angular cutting edge, applicant notes that Johnson does not teach or suggest the formation of a conical bottom surface as claimed. As to the teaching of Kottilingam as to a conical bottom surface, applicant argues that it cannot be combined with the other references as discussed in (1) above, and further that it does not suggest a routed portion defined by

a sidewall and conical bottom surface extending from the sidewall as presently claimed in claims 1 and 13. As to David, applicant argues that it does not disclose a specific profile of the routed portion and thus, also does not teach or suggest the claimed routing pattern. Applicant argues that as none of the references discloses the claimed pattern, the combination of the references fails to teach or suggest the independent claims 1 and 13 or their dependent claims.

The Examiner has reviewed these arguments, however, the rejection is maintained. (1) As to the removal of the actual defect and a proximate portion of the workpiece, the Examiner has cited the admitted state of the prior art as teaching that it is common to repair defects by "routing an oversized area to remove the defect" and then filling the defect with flame sprayed aluminum (see page 1 of the specification). Such routing of an oversized area to remove the defect would, of course, remove the actual defect and "a proximate portion" of the workpiece surrounding the defect. While Kottilingham teaches not to remove all of the crack, Kottilingham also teaches various features as to groove formation where a repair groove is formed in a workpiece and a thermal spray filler is provided in the groove. Kottilingham specifically teaches that the vertical depth of the groove is advantageously conical shaped to promote better fusion. One of ordinary skill in the art would look to Kottilingham because it is concerned with the same problem as applicant, the repair of defects by thermal spraying. While Kottilingham does not teach to remove the entire defect, its teachings as to groove formations and fusion results would not teach away from the present

application or the admitted state of the prior art, because the groove formation and fusion results look to the thermal spray filling method, not the exact location of the groove. (2) As to the formation of a routing pattern such that a sidewall and conical bottom surface extending angularly from the sidewall ^{is formed} as claimed, it is the Examiner's position that the combination of the art directly suggests such a pattern. Specifically, Johnson teaches the plunging to get an orthogonal sidewall and Kottlingham teaches the desire to have the "vertical depth", which would be the bottom of the "groove" to be conical shaped in order to specifically promote better fusion. As to the angular extension, it is the Examiner's position that clearly a conical shaped routing bit for providing the conical bottom surface would provide the angular extension, just as in Figure 5 of Johnson the rounded edge leads to a rounded edge in the corresponding routed portion. The exact shape to be routed out would be dependent on the shape and location of the defect, as noted by Kottlingham's teaching that various geometries can be used.

Conclusion

6. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not

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mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Katherine A. Bareford whose telephone number is (571) 272-1413. The examiner can normally be reached on M-F(6:00-3:30) with the First Friday Off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Timothy Meeks can be reached on (571) 272-1423. The fax phone numbers for the organization where this application or proceeding is assigned are (571) 273-8300 for regular communications and for After Final communications.

Other inquiries can be directed to the Tech Center 1700 telephone number at (571) 272-1700.

Furthermore, information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).


KATHERINE BAREFORD
PRIMARY EXAMINER